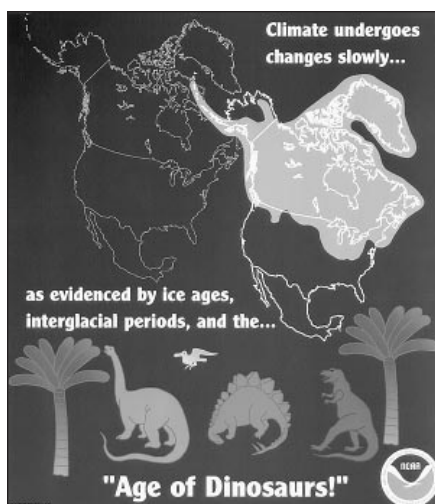


Long-term Climate Change



The earth's climate has changed many times over thousands of years. Some of its changes have affected human, plant, and animal life profoundly.

Ancient Climate History

Archaeologists suggest the first people arrived in America between 15,000 and 30,000 years ago. During that time much of North America was covered by two great ice sheets that were nearly two miles thick in places. Some 14,000 years ago, the great North American ice sheets began to melt and by 7,000 years ago they were gone.

This end to the ice ages caused dramatic changes in North America. Cold-loving spruce trees moved their range northward by about a thousand miles, giving way to grassland and broadleaf trees. Mastodons and other large mammals that preferred cold climates may not have been able to adapt to the warmer, drier conditions, and disappeared from the earth.

A Little About the Little Ice Age

For several hundred years, Europeans experienced what is known as the "Little Ice Age." It was at its strongest between 1570 and 1730. During the Little Ice Age, the advance of glaciers along with severe winters displaced and brought famine to entire communities. The effects lingered until the beginning of the 19th century.

Recent Climate History

Climatologists at the University of Massachusetts at Amherst have reconstructed global temperatures over the past 600 years. In a study released in April 1998, they reported that 1997, 1995, and 1990 were the warmest years since at least 1400 A.D. And global surface temperatures in the 1998 meteorological year (December 1, 1997 to December 1, 1998) set a new record since reliable temperature records began back in the 1880s. Some of the warming seen in 1998 was undoubtedly due to the unusually strong El Niño.

Although long-term climate changes may have been affected by changes in solar radiation, greenhouse gases produced by human activities appear to have had an increasing influence on temperatures.

Since the pre-industrial era, atmospheric concentrations of carbon dioxide have increased by nearly 30 percent, methane concentrations have doubled, and nitrous oxide concentrations have risen by 15 percent.

What Might Happen?

Even a small increase in global temperature can affect the climate system and bring about enormous changes in the natural processes that humans depend upon. The difference between today's global temperature and that of the ice ages is only 9-12 degrees Fahrenheit.

The natural systems that could be affected by a rise in temperature include the level of the world's oceans and the range and diversity of forests. These physical changes may well have positive as well as negative and potentially irreversible impacts on ecological systems, human health, and our social and economic systems.



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